

## REMARKS

### Proposed Drawing Correction

In the Office Action, the drawings were objected to on the basis that reference characters "28" and "30" were both used to designate edge 30, and reference characters "310" and "306" were both used to designate inner walls. Accompanying this response is a proposed drawing correction showing proposed changes in red and a clean version of the amended drawings. In the proposed drawing amendment, reference characters 28 and 30 no longer both designate edge 30. However, as discussed with the Examiner by phone, reference characters 310 and 306 have not both been used to designate inner walls. Applicant reiterates that although, in some instances, the *inside surface* of the outer wall is labeled 310, such inner surface is nonetheless part of the *outer wall* rather than the *inner wall*.

The drawings were also objected to for failing to show a bracket framing each of the exploded views. In the proposed amendment, such brackets have been added.

The drawings were yet further objected to for failing to include the reference numerals 54, 78, 84, 99, 126, and 137. The proposed drawing amendment shows reference numerals 54 and 78 added to Figure 13 and reference numeral 84 added to Figure 18. However, Applicant submits that contrary to the Office Action, reference numeral 99 was shown in Figure 18, reference numeral 126 was shown in Figure 25, and reference numeral 137 was shown in Figure 26 as originally filed.

In view of the foregoing, Applicant requests that the proposed amendments to the drawings be accepted and acknowledged as overcoming all of the objections to the drawings. Upon allowance of the proposed drawing amendments, Applicant will submit the amended formal drawings to the Official Draftsperson.

**Specification Has Been Amended to Overcome Objections Thereto**

The paragraph of the specification that spans pages 19 and 20 was objected to for being unclear as to how the terminal pins 38 and 40 can protrude through abutted walls 18. Applicant has amended the specification by adding the phrase "at least partially" in front of the phrase "abutted end walls 18" such that it is now clear that the end walls do not necessarily abut each other at the location of the terminal pins. In view of this amendment, Applicant requests that the objection to the specification be withdrawn

**Claims 14-17, 20, and 21 are no longer indefinite under 35 USC §112**

In the Office Action, claims 14-17, 20, and 21 were rejected under 35 USC §112, second paragraph, as being incomplete for omitting essential step language amounting to a gap between the steps. Applicant interprets this rejection as merely an objection to the style of these claims. If the Examiner disagrees, Applicant request that the Examiner cite proper authority for making such a §112 rejection on these grounds.

In view of the objection, Applicant has amended each of these claims to incorporate such stylistic omissions, without adding new matter to the application and without altering the scope of these claims. In view of these amendments, Applicant respectfully requests that the objections to claims 14-17, 20, and 21 under 35 USC §112 be withdrawn. Moreover, because claims 15-17, 20, and 21 were not rejected based on prior art, Applicant requests notification of the allowance of these claims.

**Claims 1-3 and 7-9 are Neither Anticipated by nor Obvious in View of the Prior Art**

Claims 1-3 and 7-9 were rejected under 35 USC §102(e) as being anticipated by U.S. Patent No. 5,494,318 issued to Butts et al. (hereinafter the Butts reference) and by U.S. Patent No. 5,433,484 issued to Ewen, et al. (hereinafter the Ewen reference). The Office Action

alleges that the coupler disclosed in the Butts reference engages the first walls of the pipes via an annular interference, as is required by claim 1. However, as amended, claim 1 requires the coupler to having a diameter different from the diameter of the surface of the first wall of each of the pipes such that the coupler is engaged with the first walls of the pipes in an annular interference fit. Applicant submits that a coupler disclosed in the Butts reference is in fact incapable of engaging the first walls of the pipes via an annular interference fit because, as stated in column 2, lines 20-24, the ring or coupler disclosed in the Butts reference "has an exterior diameter equal to the interior diameter of the container pipe and an interior diameter equal to the exterior diameter of the carrier pipe." As such, the coupler disclosed in the Butts reference is specifically designed to avoid creating an annular interference fit with either of the walls of the pipes that it joins because it does not have a diameter different from that of either of the walls of the pipes. This is because the coupler disclosed in the Butts reference is merely used to position a thermoplastic encased electrical resistant heating element axially between each of the abutted first and second end walls of the pipes. In contrast, the coupler of the present invention is configured to create a fusion weld radially between the coupler and each of the first and second walls of the pipes being joined. Forming the coupler of the Butts reference to create an annular interference fit would actually hinder the performance of such coupler. Thus, because the coupler disclosed in the Butts reference does not disclose or suggest a coupler capable of engaging the first walls of the pipes via an annular interference fit, the Butts reference fails to anticipate or make obvious claim 1 of the present application.

Moreover, claim 1 requires that at least one of the axial end portions of the coupler is heat fused to the end margin of at least one of the pipes. In contrast, the coupler disclosed in the Butts reference is heat fused only at its center portion rather than at either of their end portions. Again, this is due to the fact that the coupler of the Butts reference is designed to fuse

the end margins of the first and second pipes directly to each other. For this additional reason, the Butts reference fails to anticipate or make obvious claim 1 of the present application.

Similar to the Butts reference, the coupler disclosed in the Ewen reference is disclosed in column 5, lines 1-4, as having an inner diameter equal to the outer diameter of the pipe walls that it joins and therefore does not have a diameter different from the diameter of the surface of each of the first pipes in a manner such that the coupler is engaged with the first walls of the pipes in an annular interference fit. The taper portions of the coupler disclosed in the Ewen reference are configured to merely guide the coupler into proper alignment with the pipes as such pipes are being joined and does not, as suggested in the Office Action, radially deflect or cause any interference with either the inner or outer walls of the pipes. Thus, unlike the coupler of the present invention, the coupler disclosed in the Ewen reference is used in conjunction with a clamping member as shown in Figure 5 and as discussed in column 7, lines 1-14. In other words, the clamping member, rather than the coupler, is used to maintain the "intimacy of the fit between the inner surface of the second coupling and the outer surfaces of the secondary pipes." Thus, the coupler of the present invention eliminates the need for such a clamping member and therefore provides significant advantages over the coupler of the Ewen reference. Because the Ewen reference fails to disclose or suggest the interference limitation of claim 1, the Ewen reference fails to anticipate or make obvious claim 1.

Moreover, claims 2-3 and 7-9 are dependent upon claim 1 and, because claim 1 is neither anticipated by nor obvious in view of either the Butts reference or the Ewen reference, it follows then that claims 2, 3, and 7-9 are also not anticipated by or obvious in view of these references. For all these reasons, Applicant requests that the rejections of claims 1-3 and 7-9 be withdrawn.

**Claims 10 and 11 are neither Anticipated by nor Obvious in View of the Prior Art**

Claims 10 and 11 were rejected under 35 USC § 102(e) as being anticipated by U.S. Patent No. 5,824,179 issued to Greig (hereinafter the Greig reference). However, both claims 10 and 11 require, among other things, a coupler having a diameter different from the diameter of the surface of the first wall of each of the pipes such that the coupler is engaged with the first walls of the pipes in an interference fit in a manner such that the first wall of the end margin of each of the pipes radially deflects toward the second wall of the end margin of the respective pipe. As was the case with the Butts and Ewen references, the coupler disclosed in the Greig reference does not have a diameter different from the surface of the first wall of each of the pipes such as to create any interference fit. The coupler of the Greig reference is described in column 2, lines 4-5, as having "a loose fit upon the pipe" creating "a diametral clearance." Moreover, the pipes disclosed in the Greig reference failed to have any "radially spaced annular first and second walls separated by a void" as is further required in each of claims 10 and 11. Thus, because the Greig reference fails to disclose or suggest the above-mentioned limitations of each of claims 10 and 11, the Greig reference fails to anticipate or make obvious such claims.

For the foregoing reasons, Applicant requests the rejections of claims 10 and 11 be withdrawn.

**Claims 12-14, 18, and 19 are Neither Anticipated by nor Obvious in View of the Prior Art**

Independent claim 12 requires, among other things, the providing of a coupler which is dimensioned such that the coupler has a diameter different from the diameter of the surface of the first wall of each of the pipes such that the coupler is adapted to engage with the first wall of the end margin of each of the pipes in an annular interference fit. Claim 12 also requires the insertion of one of the axial end portions of the coupler between the inner and outer wall of one of the pipes in a manner such that the coupler radially deflects the first wall of the end margin of each of the pipes. As discussed above in reference to claim 1, the couplers disclosed in the

Butts and Ewen references are incapable of creating an annular interference fit with the pipes or radially deflecting any wall of the pipes. Thus, the couplers disclosed in the Butts and Ewen references are incapable of performing the method of claim 12. Thus, these references can not possibly disclose or even suggest the method steps of claim 12 and therefore these references neither anticipate nor make obvious claim 12.

Claims 13, 14, 18, and 19 are dependent upon claim 12. Thus, because claim 12 is neither anticipated by nor obvious in view of the prior art, it follows then that these dependent claims are also neither anticipated by nor obvious in view of the prior art. For all of these reasons, Applicant requests that the rejections of claims 12-14, 18, and 19 be withdrawn.

**Allowable Claims 4-6 have been Amended to Overcome Objections Thereto**

Claims 4-6 were indicated as being allowable, but for their dependency upon a rejected base claim. Applicant has rewritten claim 4 into independent form, adding no new additional information, by incorporating all limitations of claim 1 directly into claim 4. As such, independent claim 4, and claims 5 and 6 which depend directly therefrom, are now in condition for allowance.

**Conclusion**

In view of the foregoing, claims 1-21 are in condition for allowance. Thus, Applicant requests that the Office issue a Notice of Allowance of the application.

Respectfully submitted,



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**MARKED UP VERSION OF THE SPECIFICATION**

Last paragraph beginning on page 19 and ending on page 20 (Amended):

Referring to Figure 4, terminal pins 38 and 40 are attached to ends 34 and 36 of the screen 33 and are aligned with the center of coupler 22, equidistant from sides 35 and 37, when screen 33 is wrapped around coupler 22. Terminal pins 38 and 40 are positioned in this fashion to protrude between at least partially abutted end walls 18 of pipes 10 to allow electrical connection of screen 33 in channel 20 to an external power source (not shown).



## MARKED UP VERSION OF THE AMENDED CLAIMS

1. (Amended) A joint comprising:

a pair of thermoplastic pipes, each of the pipes having an end margin terminating at a pipe end, the end margin of each of the pipes having radially spaced annular first and second walls separated by a void, the first wall of each of the pipes being one of inner and outer walls, the second wall of each of the pipes being the other of the inner and outer walls, the first wall of each of the pipes having a surface that has a diameter; and

an annular coupler having axially opposite end portions, one of the axial end portions of the coupler being positioned between the inner and outer walls of one of the pipes and the other of the axial end portions of the coupler being positioned between the inner and outer walls of the other of the pipes, the coupler [engaging] having a diameter different from the diameter of the surface of the first wall of each of the pipes such that the coupler is engage with the first walls of the pipes [via] in an annular interference fit, the coupler being at least partially formed of thermoplastic material and at least one of the axial end portions of the coupler being heat-fused to the end margin of at least one of the pipes.

4. (Amended) [The joint of claim 1, wherein the coupler has] A joint comprising:

a pair of thermoplastic pipes, each of the pipes having an end margin terminating at a pipe end, the end margin of each of the pipes having radially spaced annular first and second walls separated by a void, the first wall of each of the pipes being one of inner and outer walls, the second wall of each of the pipes being the other of the inner and outer walls;

an annular coupler having an annular groove formed therein and axially opposite end portions, one of the axial end portions of the coupler being positioned between the inner and outer walls of one of the pipes and the other of the axial end portions of the coupler being positioned between the inner and outer walls of the other of the pipes, the coupler engaging the

first walls of the pipes via an annular interference fit, the coupler being at least partially formed of thermoplastic material and at least one of the axial end portions of the coupler being heat-fused to the end margin of at least one of the pipes; and [, the joint further comprising]

an electrical resistance heating element positioned at least partially in the groove of the coupler, at least one of the axial end portions of the coupler being heat-fused to the end margin of at least one of the pipes via the electrical resistance heating element.

10. (Amended) A joint comprising:

a pair of thermoplastic pipes, each of the pipes having an end margin terminating at a pipe end, the end margin of each of the pipes having radially spaced annular first and second walls separated by a void, the first wall of each of the pipes being one of inner and outer walls, the second wall of each of the pipes being the other of the inner and outer walls, the first wall of each of the pipes having a surface that has a diameter; and

an annular coupler having axially opposite end portions, one of the axial end portions of the coupler being positioned circumjacent the first wall of one of the pipes and the other of the axial end portions of the coupler being positioned circumjacent the first wall of the other of the pipes, the coupler [engaging] having a diameter different from the diameter of the surface of the first wall of each of the pipes such that the coupler is engaged with the first walls of the pipes [via] in an interference fit in a manner such that the first wall of the end margin of each of the pipes radially deflects toward the second wall of the end margin of the respective pipe, the radial deflection being greatest at the end of the respective pipe and decreasing with distance from the end of the respective pipe, the coupler being at least partially formed of thermoplastic material and at least one of the axial end portions of the coupler being heat-fused to the end margin of at least one of the pipes.

12. (Amended) A method of joining thermoplastic pipes, the method comprising:  
providing a pair of thermoplastic pipes, each of the pipes having an end margin terminating at a pipe end, the end margin of each of the pipes having radially spaced annular first and second walls separated by a void, the first wall of each of the pipes being one of inner and outer walls, the second wall of each of the pipes being the other of the inner and outer walls, the first wall of each of the pipes having a surface that has a diameter;

providing an annular coupler having axially opposite end portions, the coupler being dimensioned in a manner such that one of the axial end portions is positionable between the inner and outer walls of one of the pipes and such that the other of the axial end portions is positionable between the inner and outer walls of the other of the pipes, the coupler also being dimensioned in a manner such that the coupler [engages] has a diameter different from the diameter of the surface of the first wall of each of the pipes such that the coupler is adapted to engage with the first wall of the end margin of each of the pipes in an annular interference fit with the first wall of the end margin of each of the pipes being radially deflected when one of the axial end portions of the coupler is positioned between the inner and outer walls of the respective pipe, the coupler having at least one electrical resistance heating element attached thereto for providing heat to fuse at least one of the axial end portions of the coupler to the end margin of at least one of the pipes when the at least one axial end portion of the coupler is positioned between the inner and outer walls of the respective pipe;

inserting one of the axial end portions of the coupler between the inner and outer walls of the end margin of one of the pipes and the other of the axial end portions of the coupler between the inner and outer walls of the end of the other of the pipes, the coupler radially deflecting the first wall of the end margin of each of the pipes; and

passing an electrical current through the at least one electrical resistance heating element to heat-fuse the coupler to the end margin of each of the pipes in a manner such that the coupler operatively permanently connects the pipes together.

14. (Amended) The method of claim 13, wherein the step of providing a pair of thermoplastic pipes further comprises providing the pair of thermoplastic pipes in a manner such that the first wall of each of the pipes is the inner wall of the respective pipe and the second wall of each of the pipes is the outer wall of the respective pipe.

15. (Amended) The method of claim 14, wherein the step of providing a coupler comprises providing the coupler with an annular groove formed therein, [the at least one electrical resistance heating element of the coupler being substantially positioned] the method further comprising positioning the at least one electrical resistance heating element substantially within the groove of the coupler.

16. (Amended) The method of claim 15, wherein the step of providing an annular coupler comprises providing the annular groove in a manner such that the annular groove of the coupler is arcuate in axial cross-sectional shape[,] and such that the at least one electrical resistance heating element of the coupler [being] is at least one rope-shaped, thermoplastic encased wire that is at least partially positioned within the groove of the coupler.

17. (Amended) The method of claim 16, wherein the step of providing an annular coupler comprises providing the annular groove in a manner such that the annular groove of the coupler winds annularly into one of the axial end portions of the coupler and overlaps itself in an immediately adjacent manner[,] and such that the groove [extending] extends to the other of the

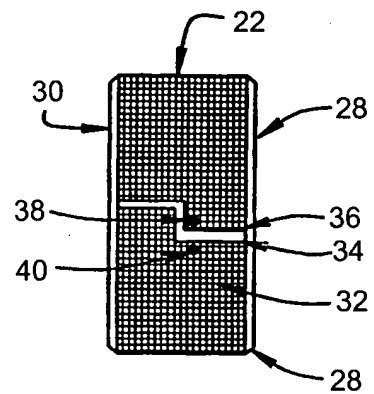
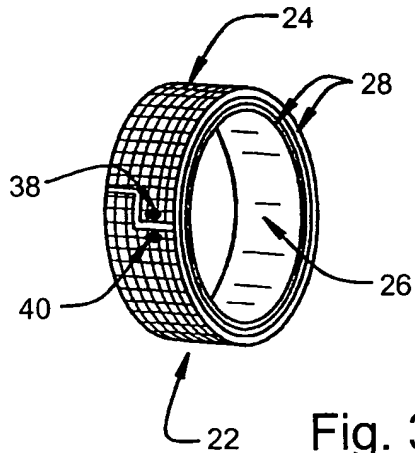
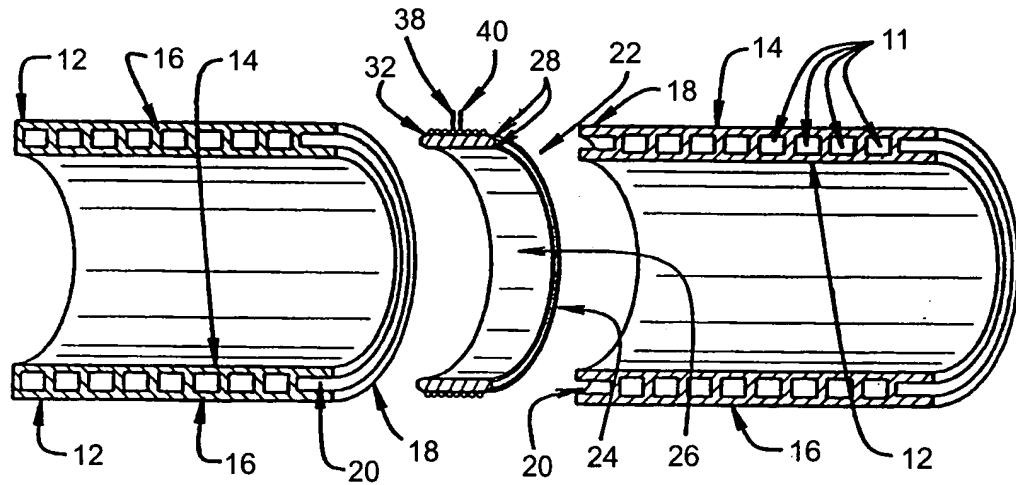
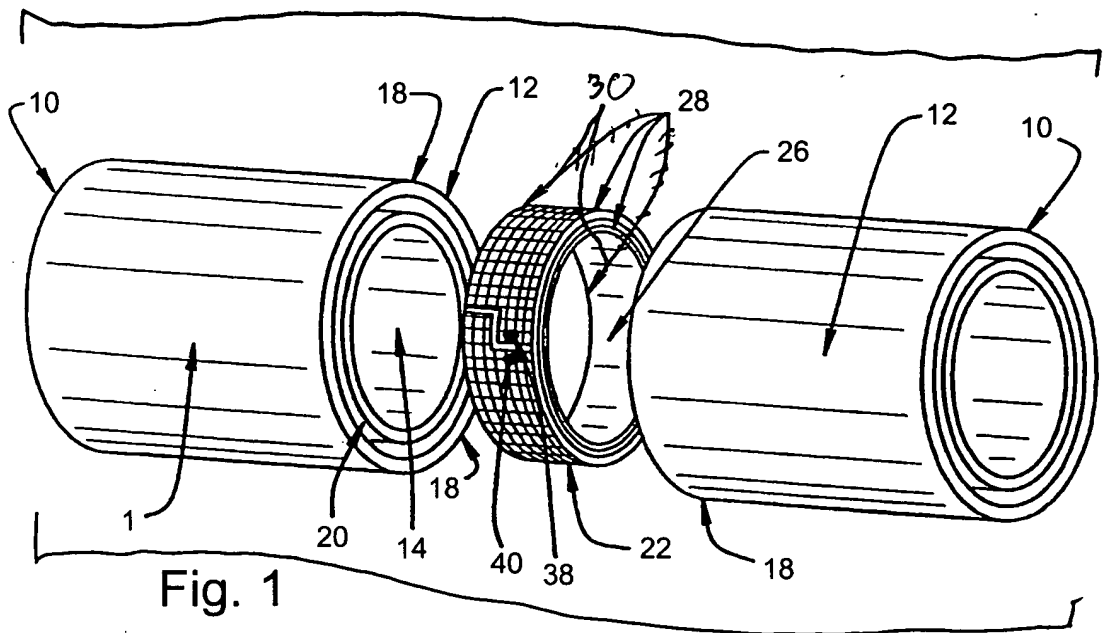
axial end portions of the coupler where the groove winds annularly into the other of the axial end portions of the coupler and overlaps itself in an immediately adjacent manner.

20. (Amended) The method of claim 12, wherein the step of providing a pair of thermoplastic pipes further comprises providing the pair of thermoplastic pipes in a manner such that the pair of thermoplastic pipes provided are helical-rib profile wall thermoplastic pipes[,] and such that the end margin of each of the pipes [having] has at least a portion of helical rib removed to form the void between the inner and outer walls of the end margin of each of the pipes.

21. (Amended) The method of claim 12, wherein the step of providing a pair of thermoplastic pipes further comprises providing the pair of thermoplastic pipes in a manner such that the pair of thermoplastic pipes provided are corrugated profile wall thermoplastic pipes.



PROPOSED DRAWING CORRECTIONS



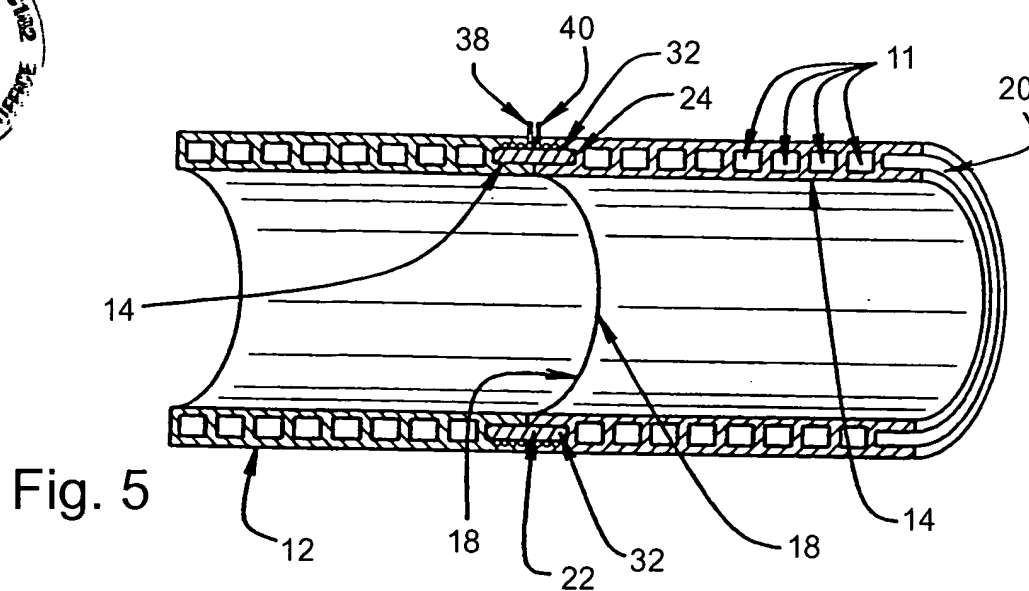


Fig. 5

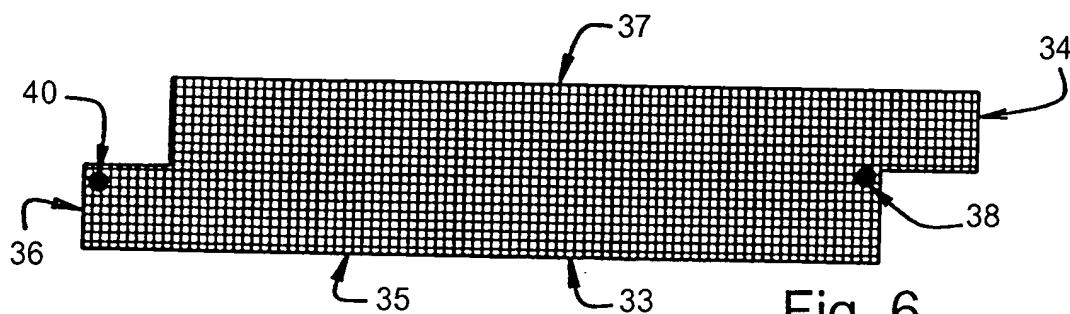


Fig. 6

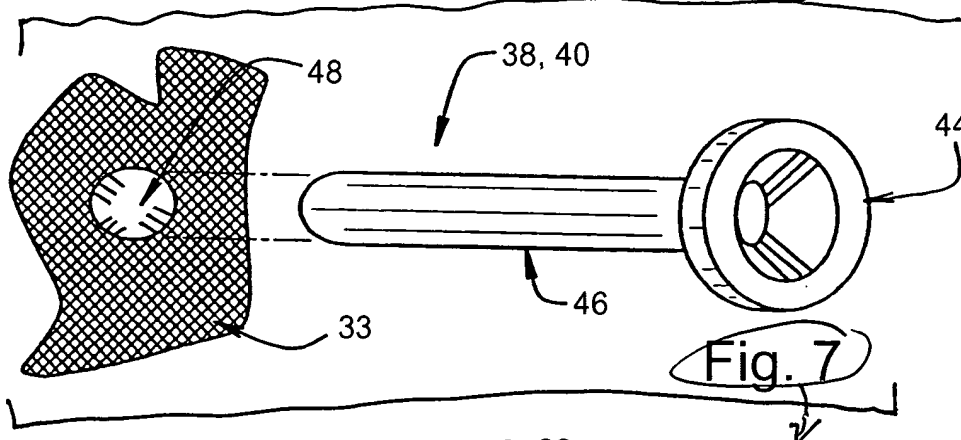


Fig. 7

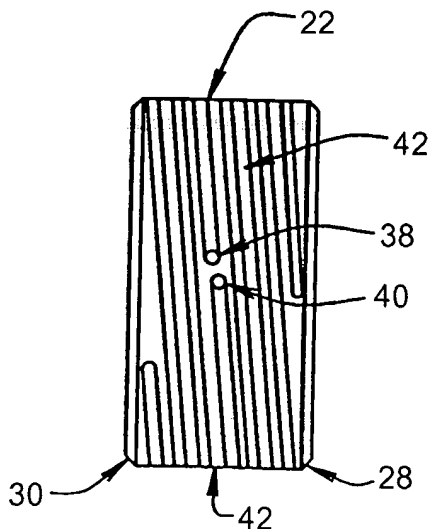


Fig. 8

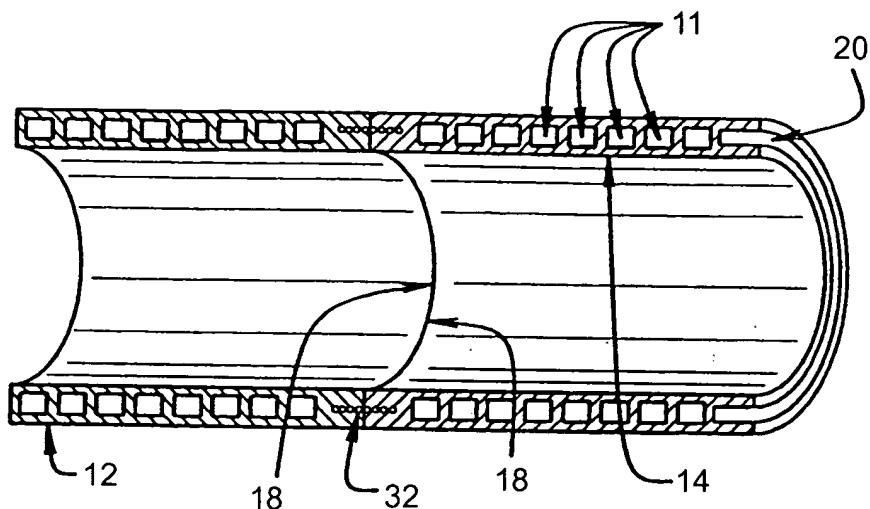


Fig. 9

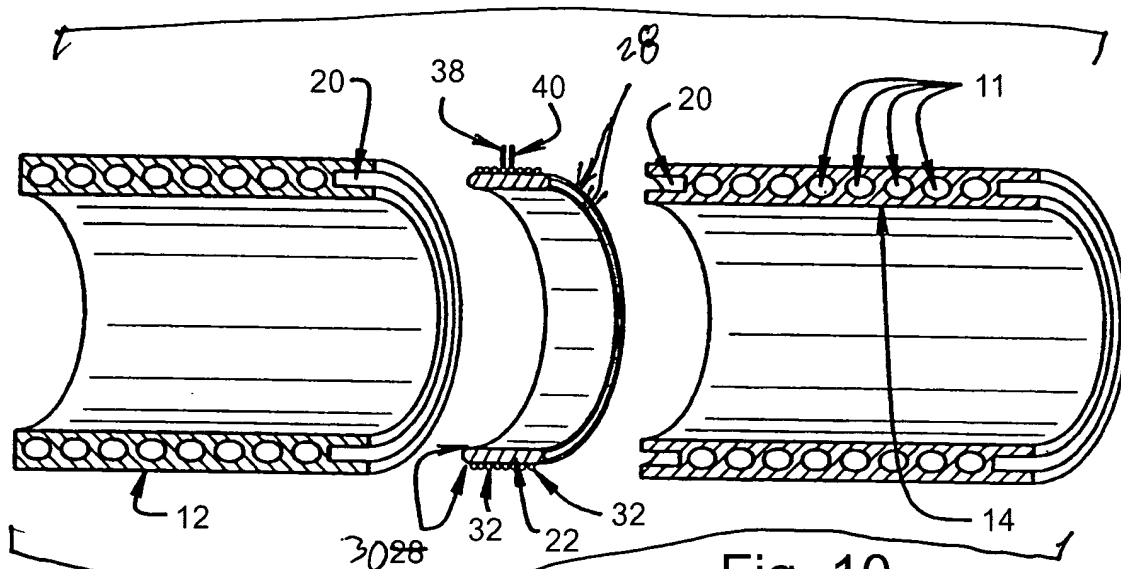


Fig. 10

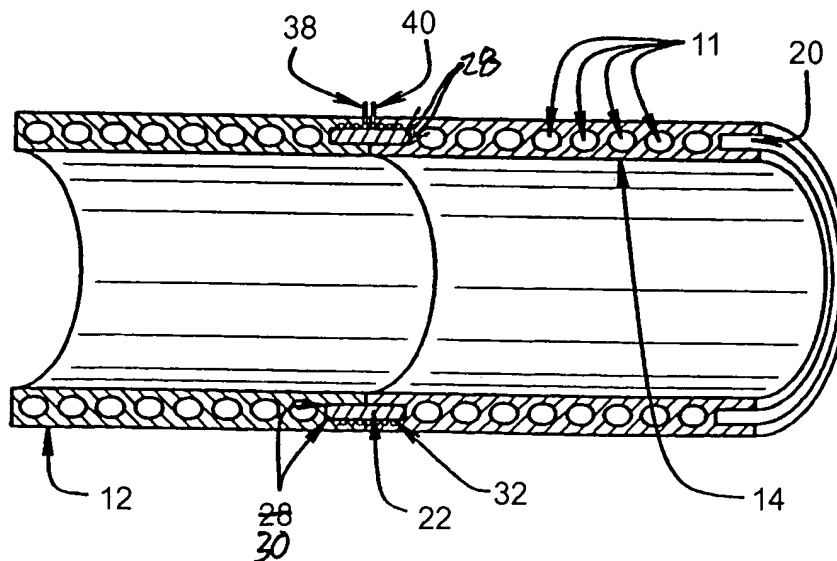


Fig. 11



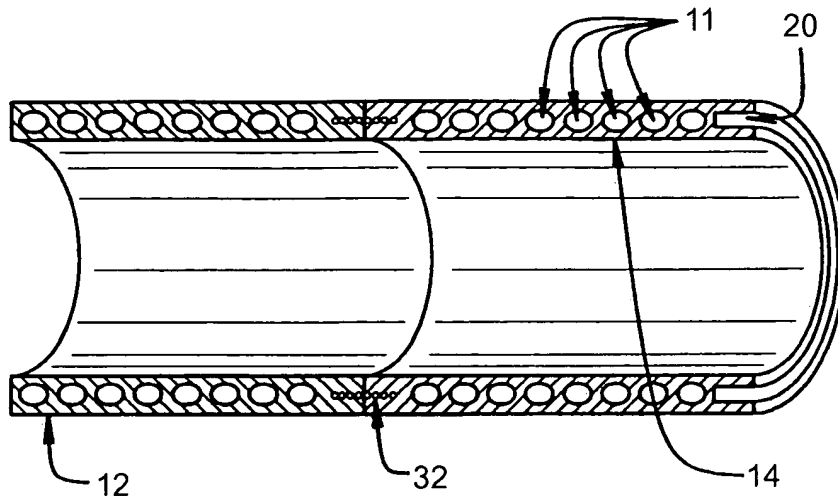


Fig. 12

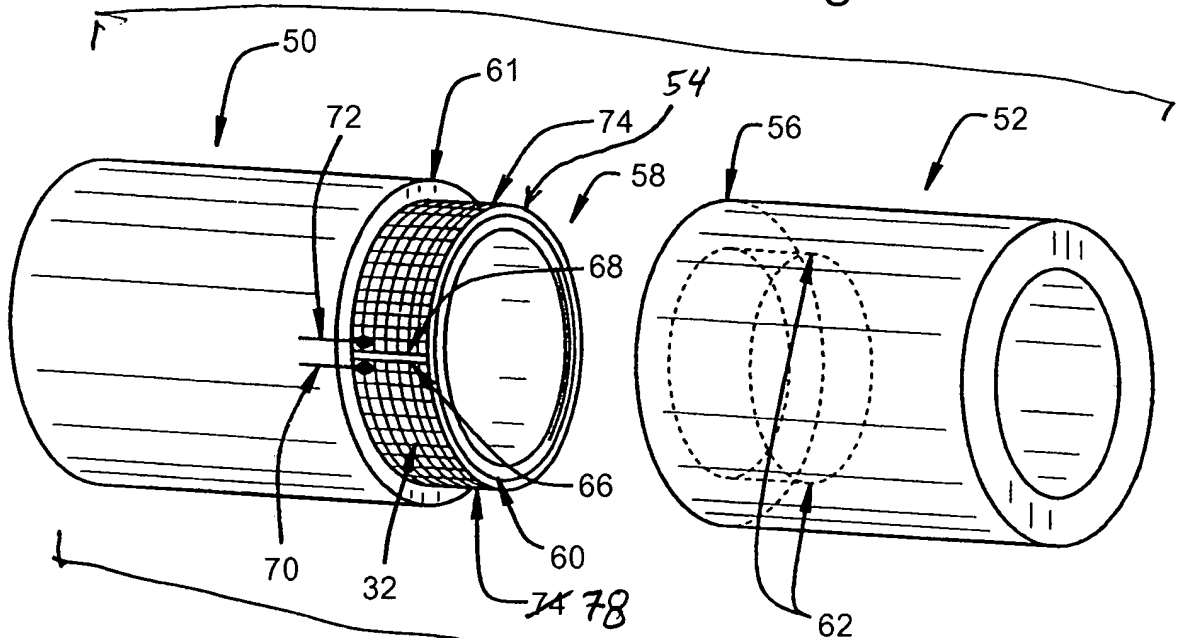


Fig. 13

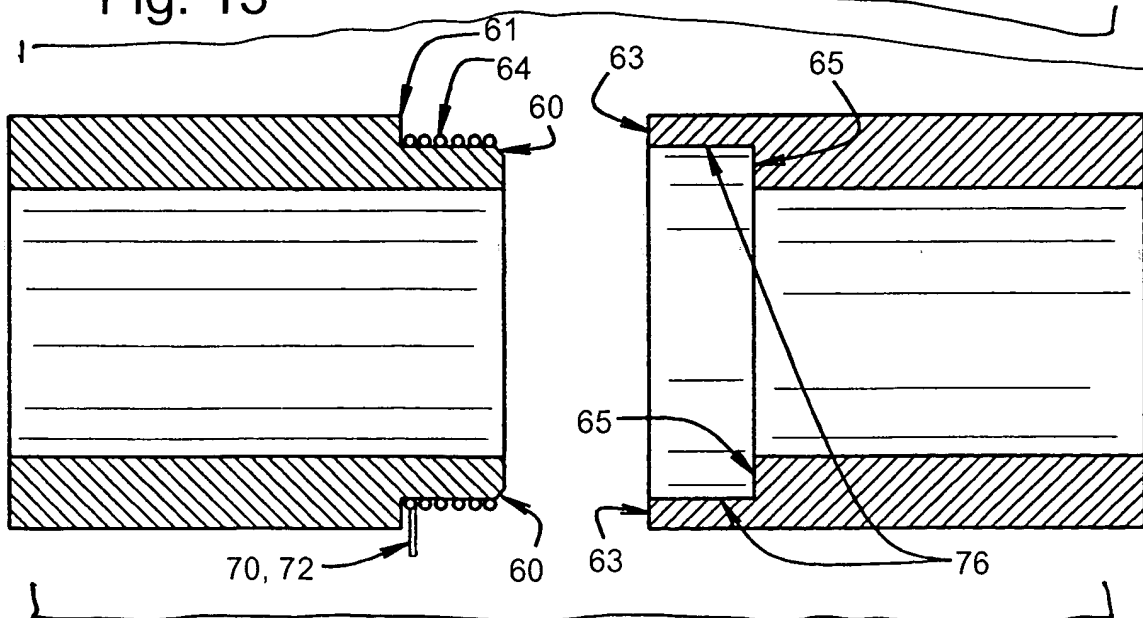


Fig. 14

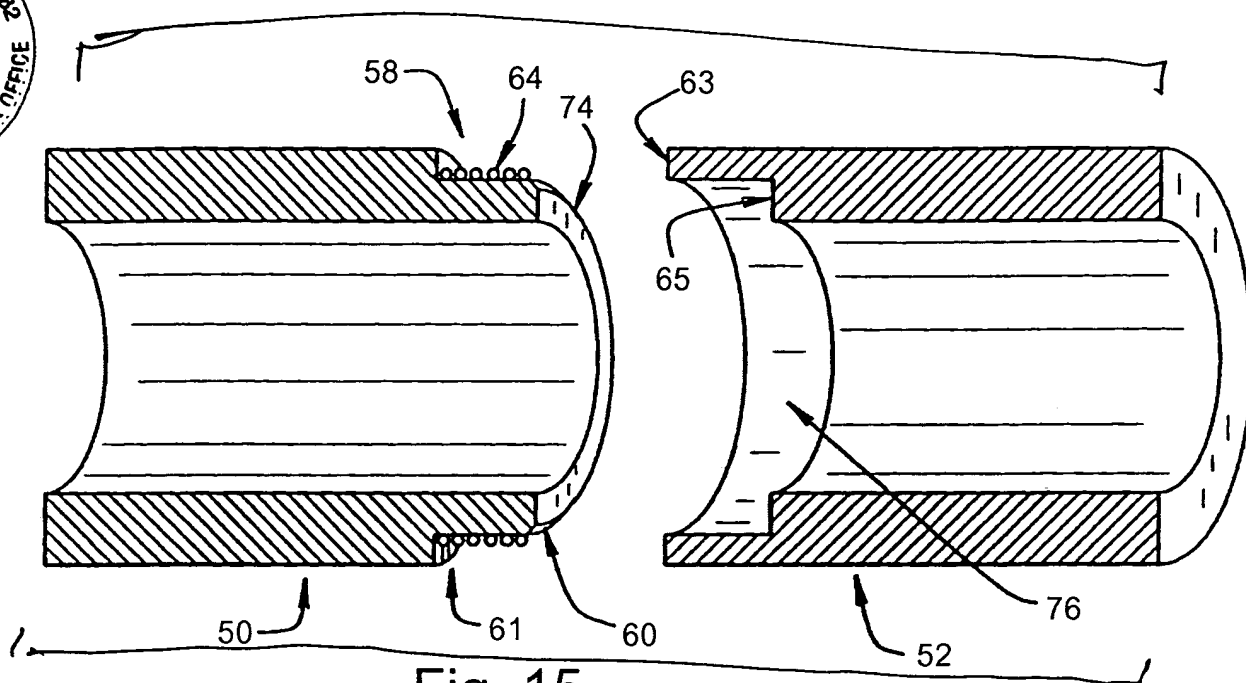


Fig. 15

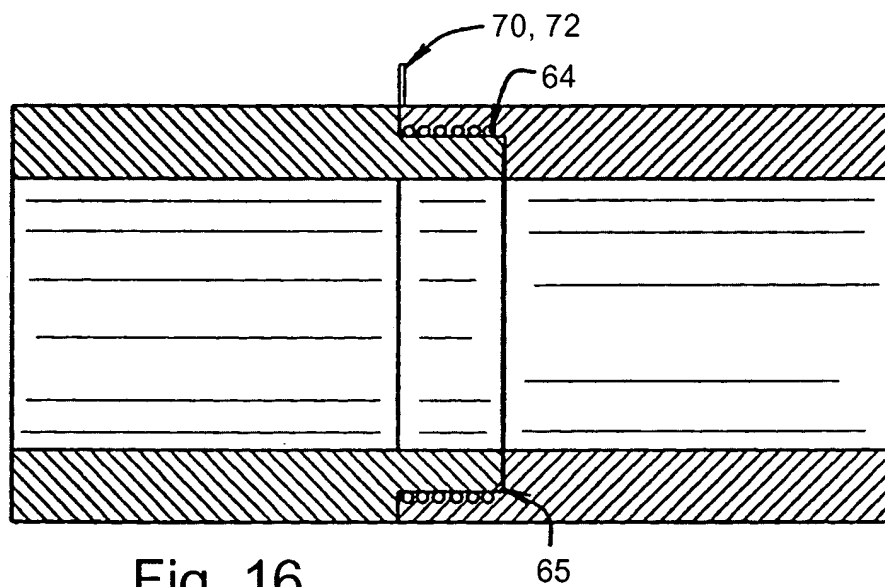


Fig. 16

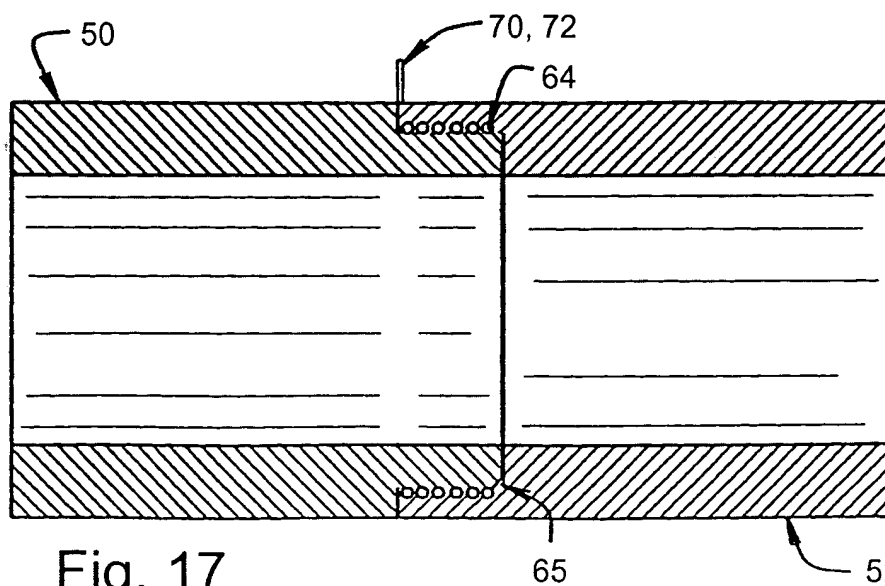


Fig. 17

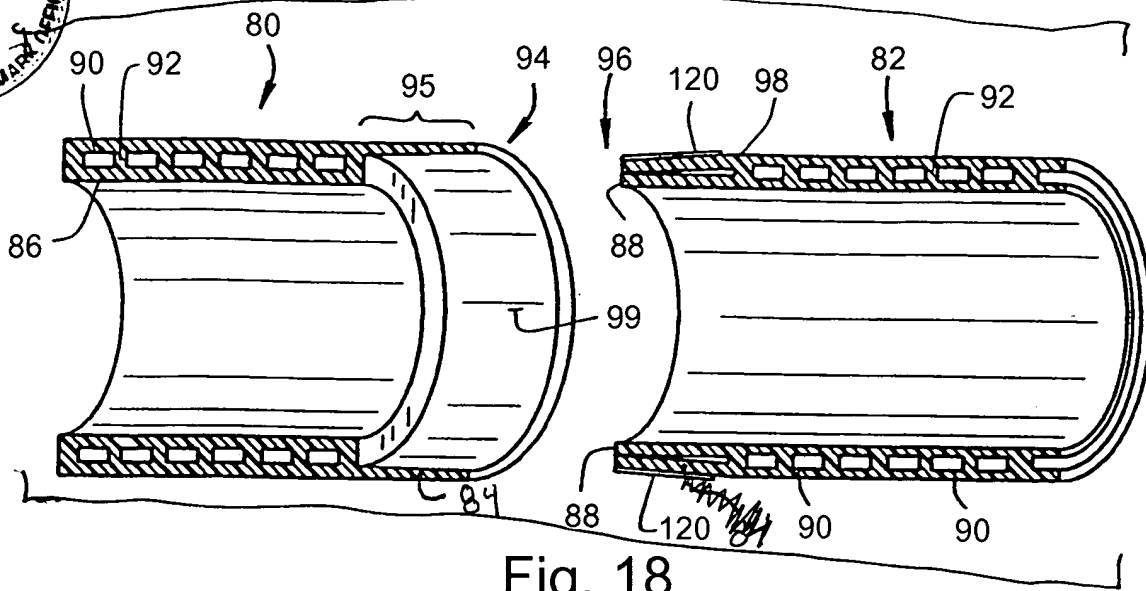


Fig. 18

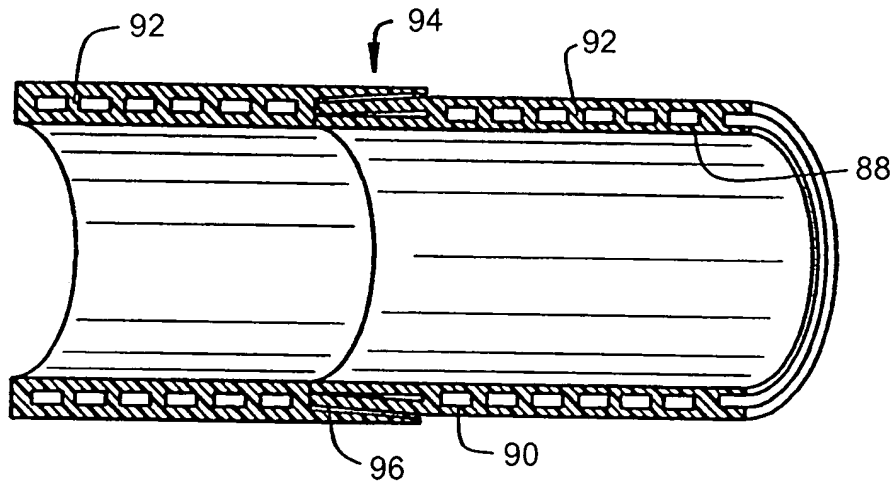


Fig. 19

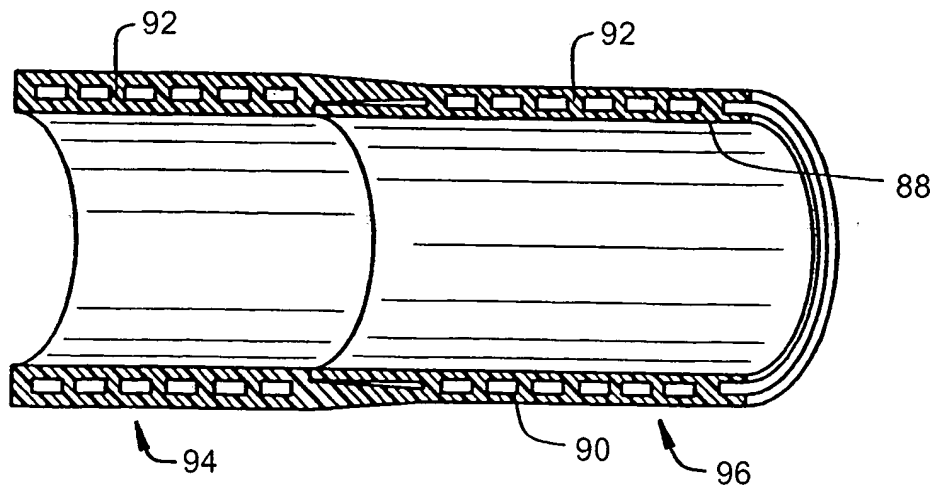


Fig. 20

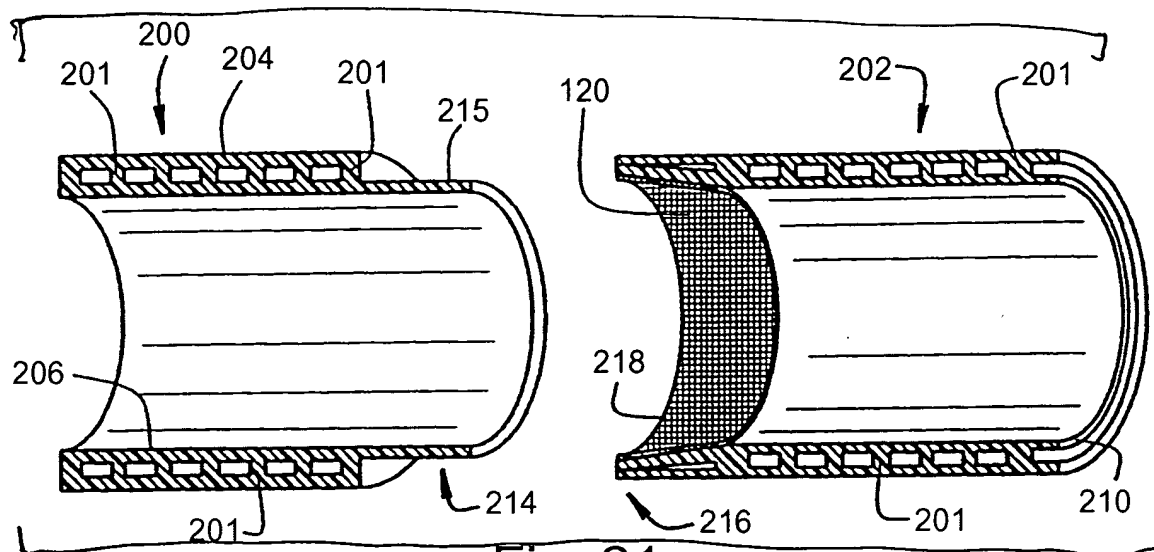


Fig. 21

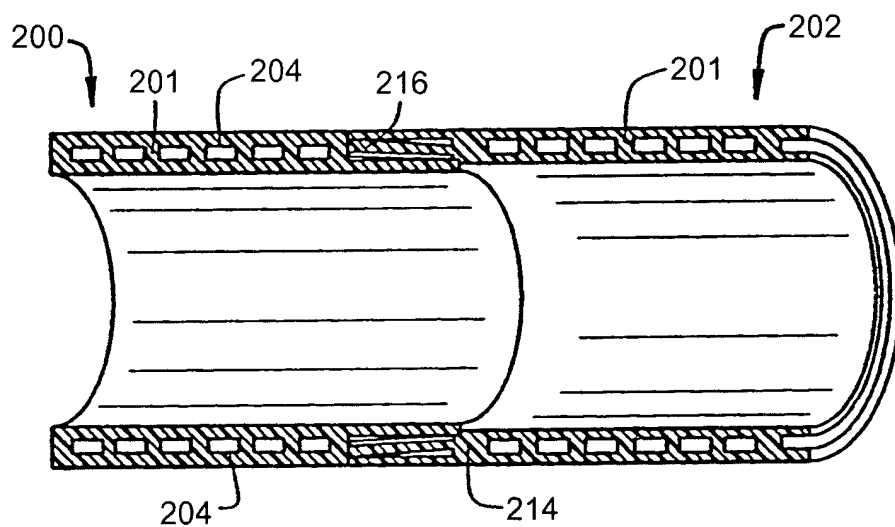


Fig. 22

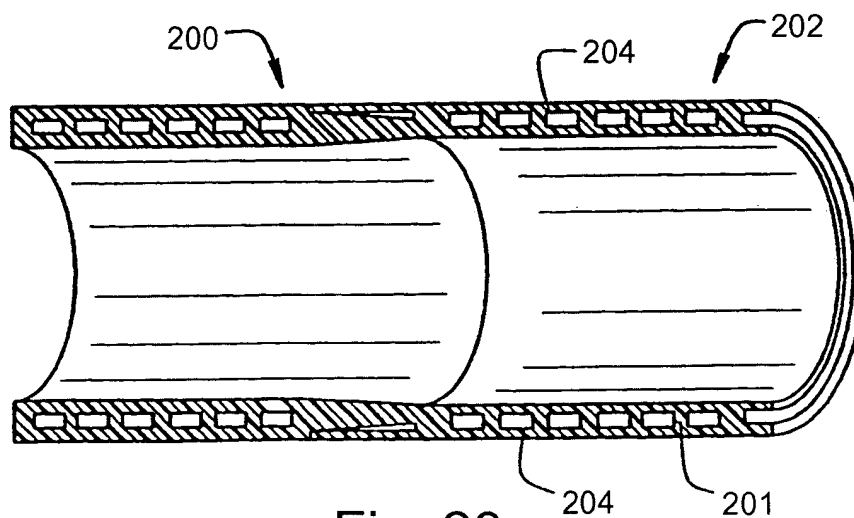


Fig. 23

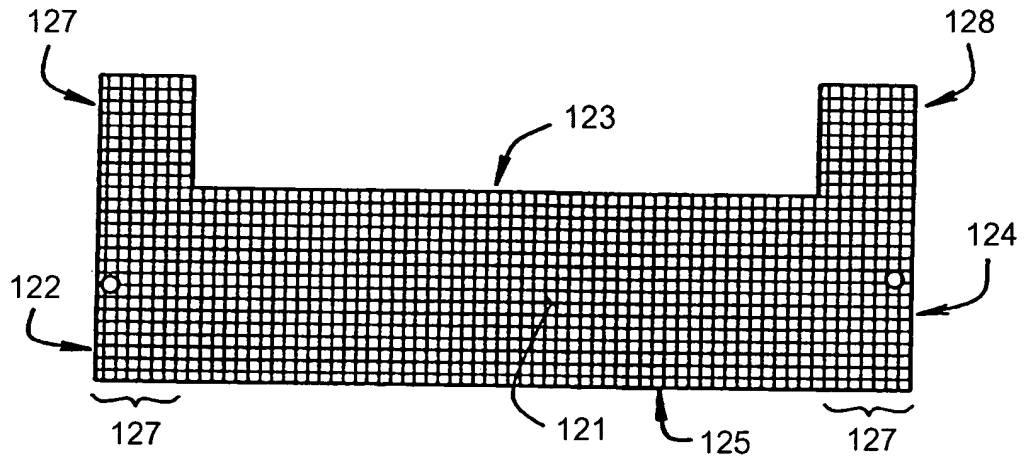


Fig. 24

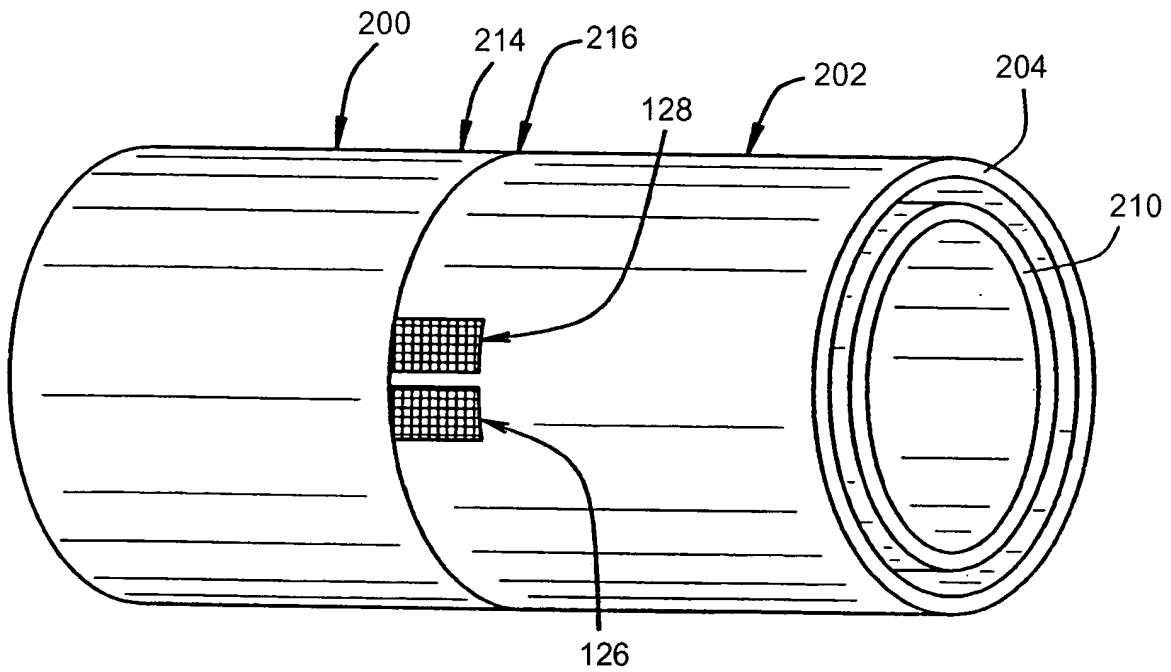


Fig. 25

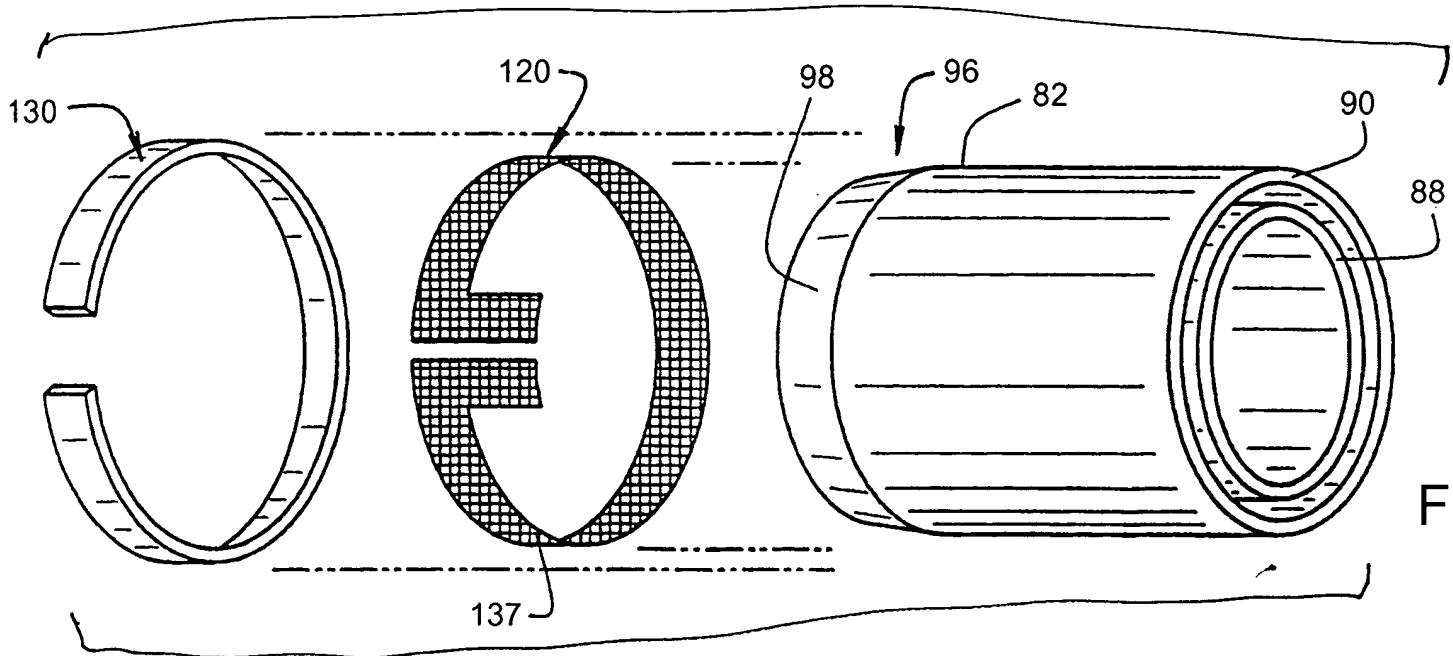


Fig. 26

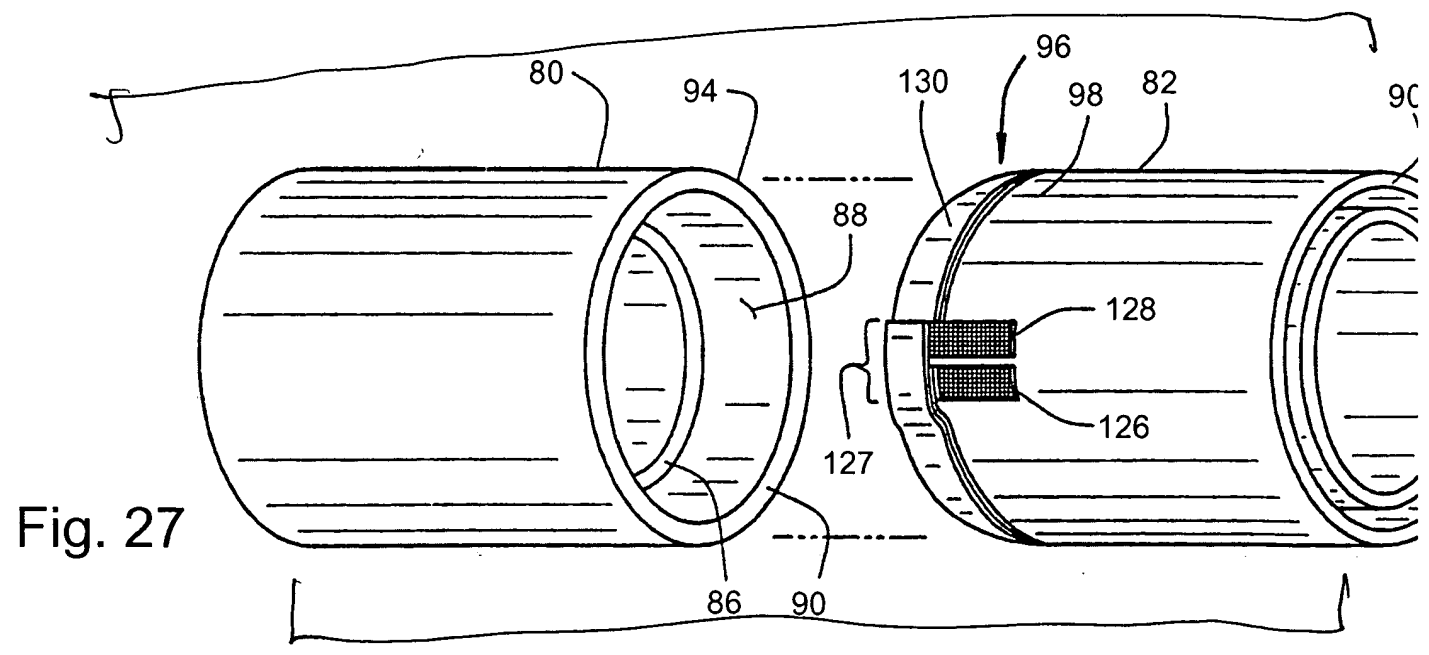


Fig. 27

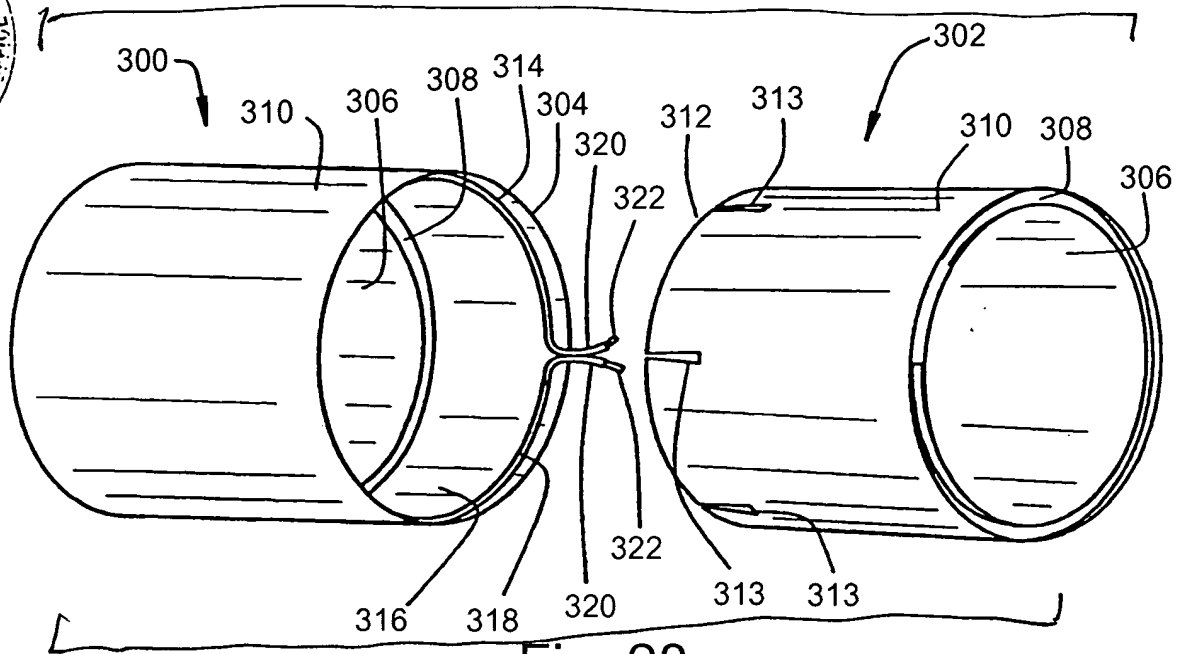


Fig. 28

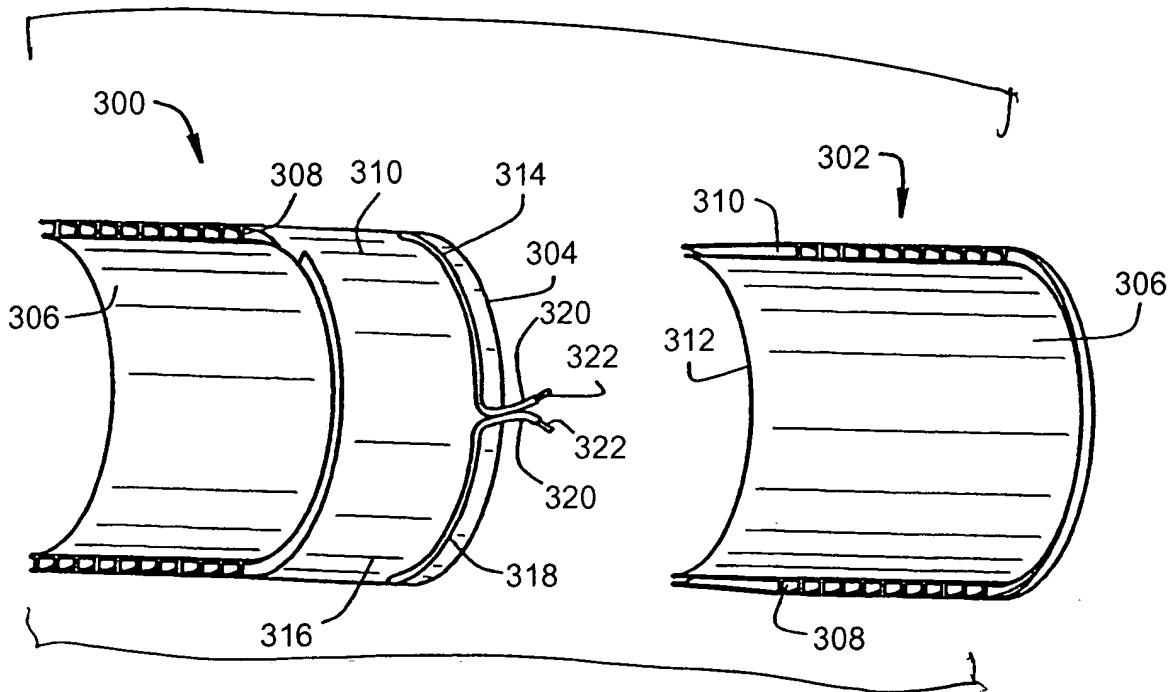


Fig. 29

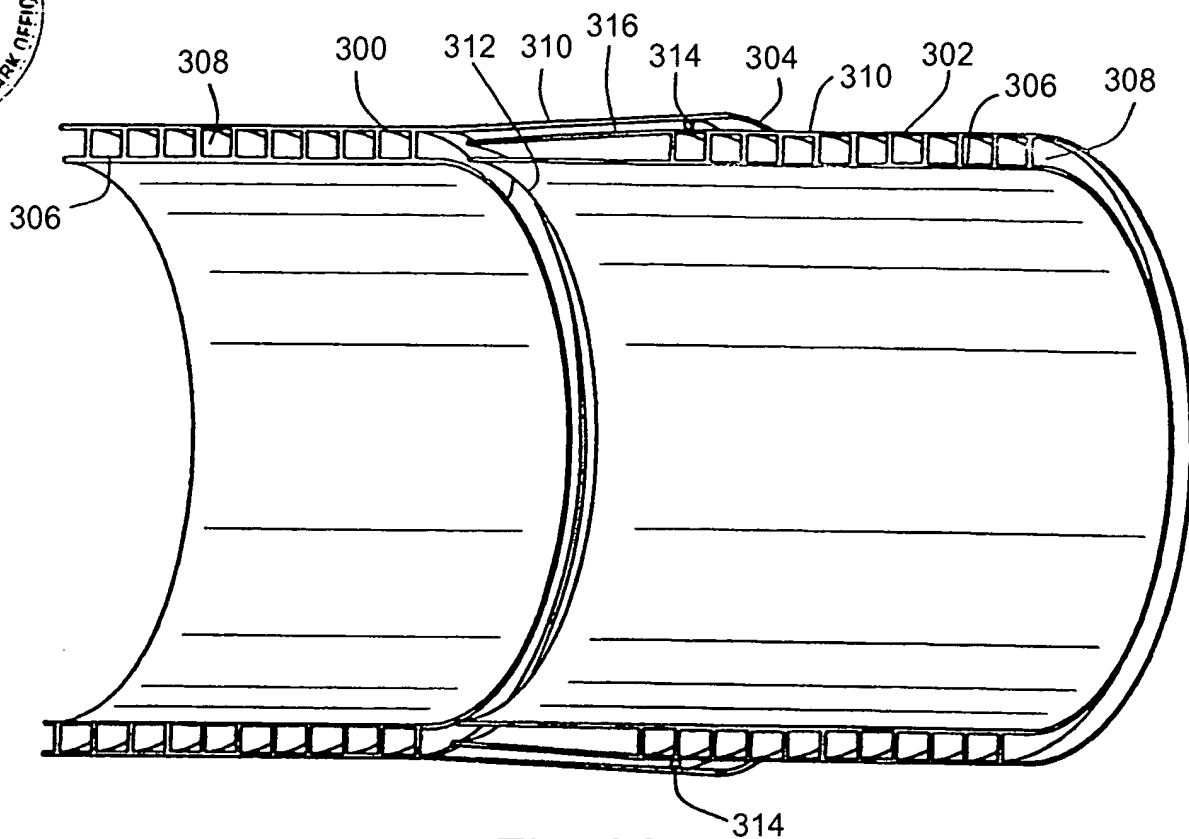


Fig. 30

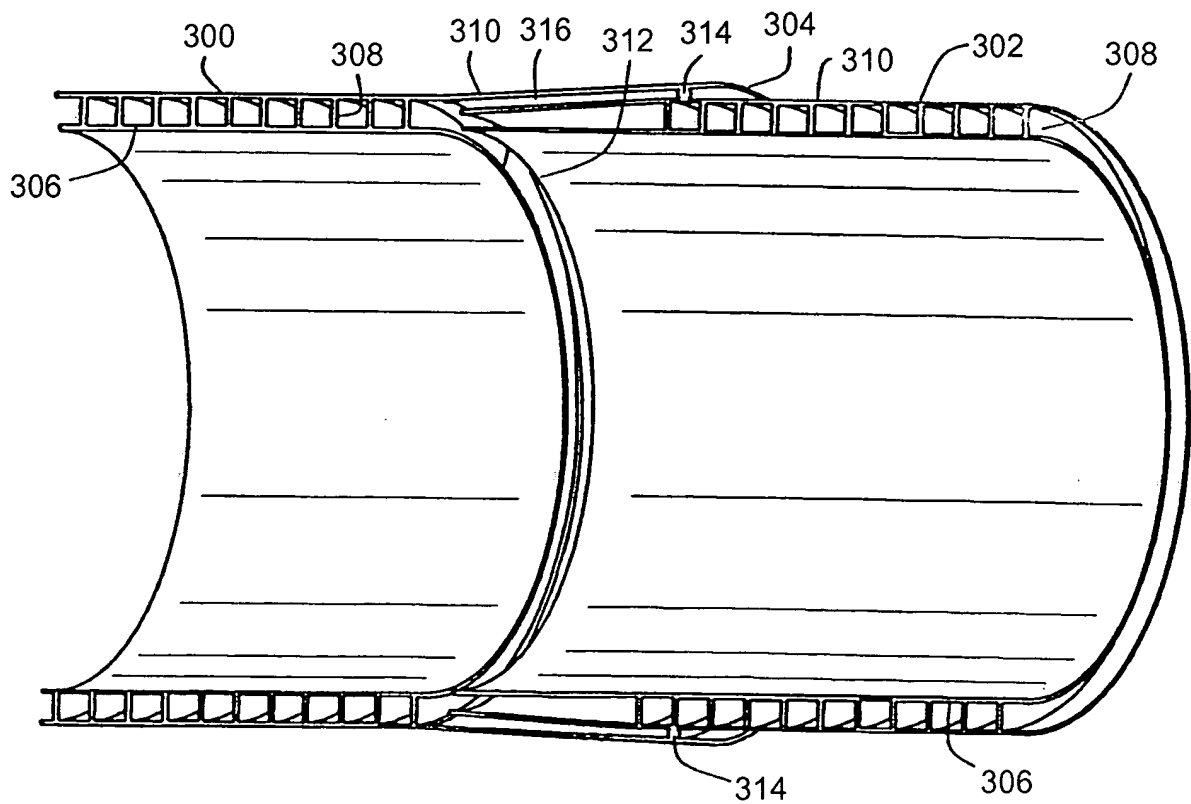


Fig. 31



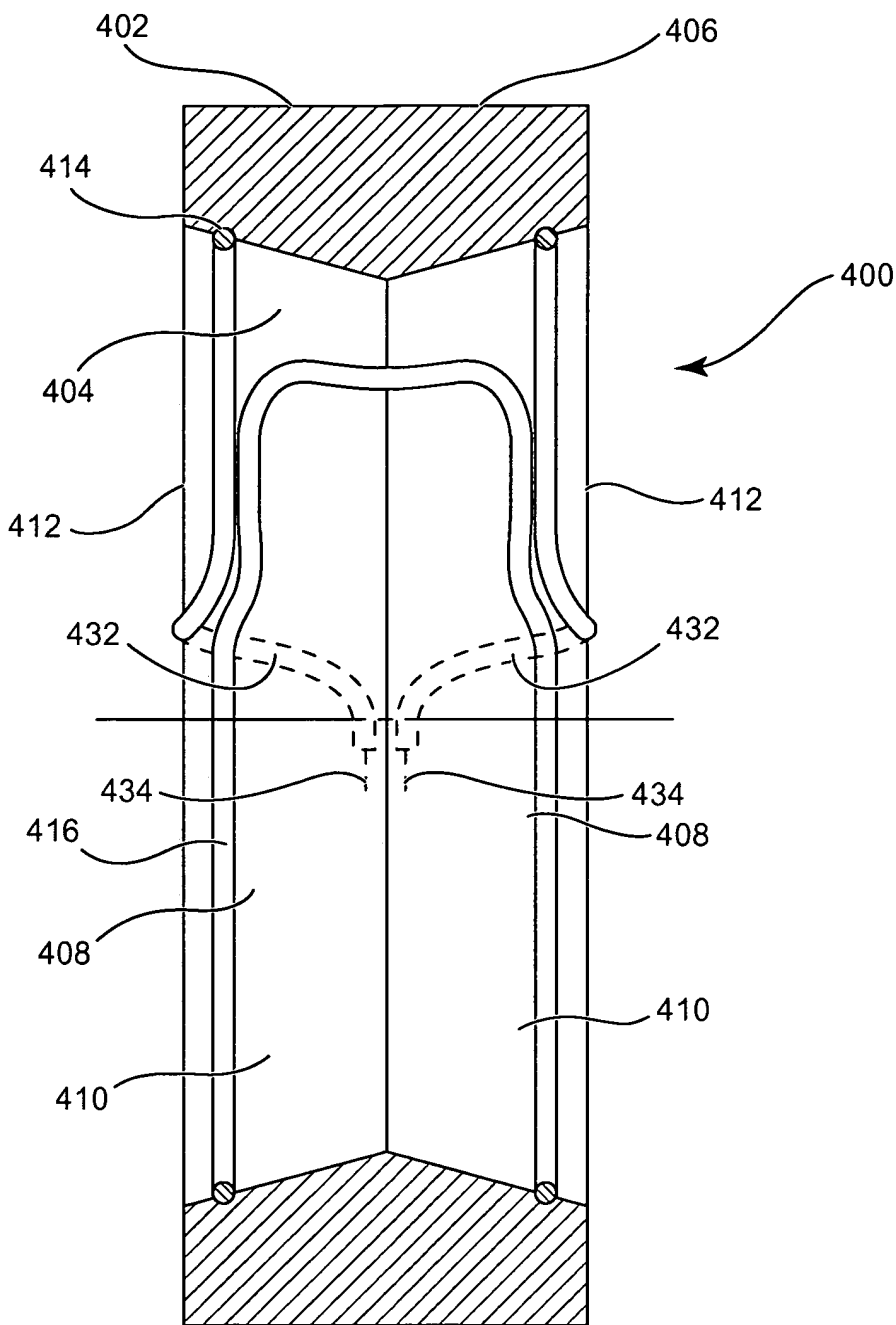


Fig. 32

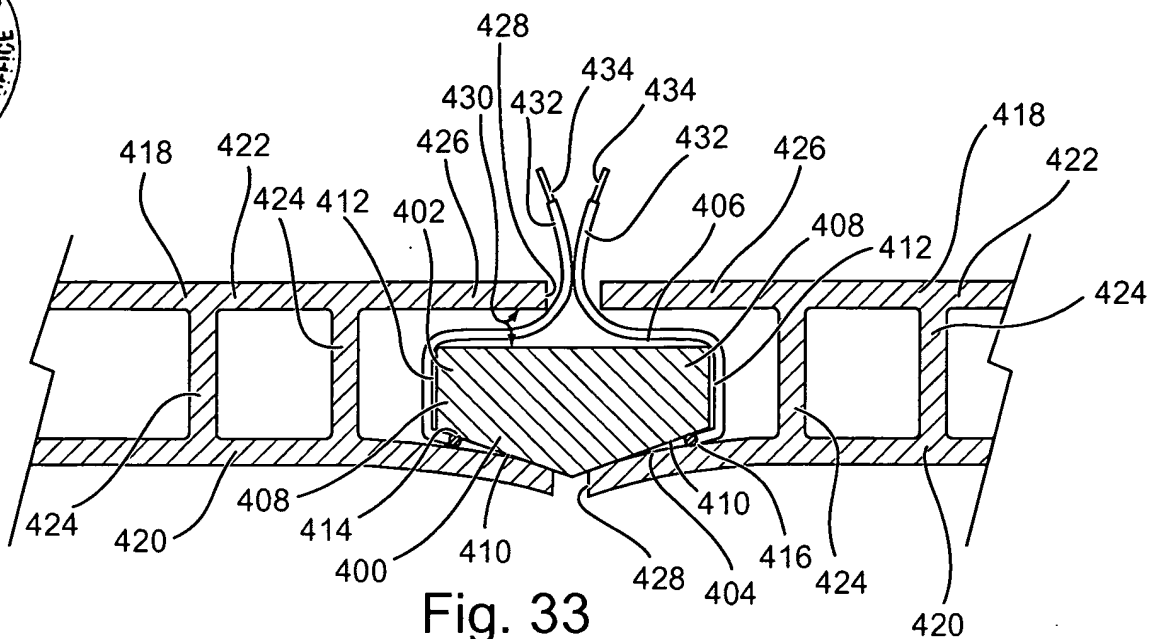
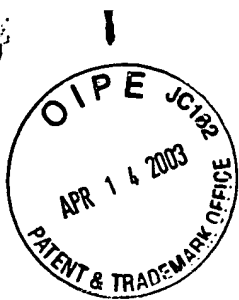


Fig. 33

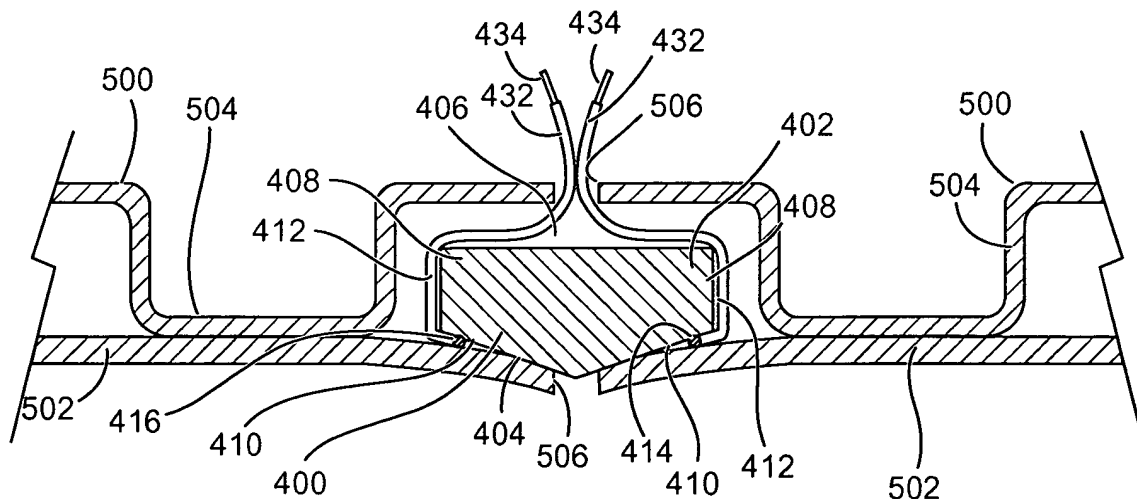


Fig. 34

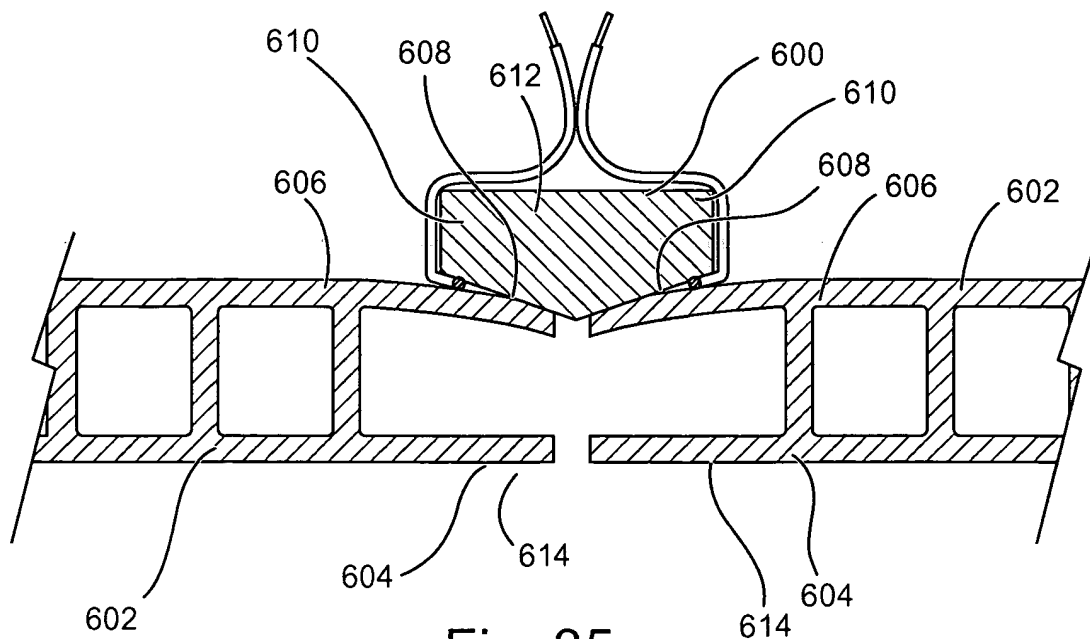


Fig. 35